

## PROCEEDINGS OF LEARNED SOCIETIES.

## ZOOLOGICAL SOCIETY.

February 26, 1839.—The Rev. F. W. Hope, in the Chair.

Mr. Fraser exhibited a new species of *Corythaix*, which he proceeded to characterize as follows :

*CORYTHAIX MACRORHYNCHUS.* *Cor. rostro prægrandi aurantiaco, ad basin sanguineo; capite, cristâ, collo pectoreque viridibus; cristâ ad apicem albâ, et purpureo notatâ; lineâ albâ infra oculos excurrente; dorso alisque metallicè purpureis; primariis sanguineis nigro marginalis; caudâ supernè metallicè viridi; femoribus caudâque subtus nigris; tarsiis nigris.*

Long. tot. 14 poll.; rostri,  $1\frac{1}{4}$ ; alæ, 6; caudæ, 6; tarsi,  $1\frac{1}{4}$ .

*Hab.* — ?

This species of *Corythaix* lived for some time in the Society's Menagerie, having been purchased from a dealer who was unacquainted with its locality.

Compared with the known species of the genus, it approaches most nearly to the *Corythaix Persa* of authors, but from this it may readily be distinguished by its smaller size; and the form, comparatively large size, and colouring of the beak. The colouring of the plumage also differs in some respects: like *C. Persa*, the head, neck, and breast are green, but the feathers on these parts are of a deeper hue than in that species; the feathers of the crest, instead of being simply tipped with white, having a white transverse line near the apex, but at the apex they are purple-black. Minute black feathers encircle the eye, and a white stripe extends from beneath the eye on to the ear. The beak is much arched above, and somewhat inflated at the base; the nostrils are very large, and not hidden, as in *C. Persa*, by the decumbent feathers, these extending only to the posterior angle of the nostril. The upper mandible is of a bright yellow colour, excepting all that portion which lies below and behind the nostrils, which is of a brilliant red colour; the lower mandible is of the same red tint, but tipped with yellow. Both mandibles present simple sharp-cutting edges, in this respect exhibiting a different structure from that observable in the allied species, *C. Persa* and *C. Buffonii*, in which the mandibles have their cutting edges serrated. The back and upper surface of the wings are of a deep purple-blue tint, exhibiting in certain parts greenish reflections. The primaries (with the exception of the first quill) and the secondaries (with the exception of the three or four innermost quills) are red, margined with black; the shafts of these feathers are also black. The outer primary is black, and the two or three following feathers are broadly margined externally with the same colour. All the wing feathers are black at the base; on the outermost feathers the

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A highly-interesting and valuable series of specimens of the Paper Nautilus (*Argonauta Argo*), consisting of the animals and their shells of various sizes, of ova in various stages of development, and of fractured shells in different stages of reparation, were exhibited and commented on by Professor Owen, to whom they had been transmitted for that purpose by Madame Jeanette Power. Mr. Owen stated that these specimens formed part of a large collection, illustrative of the natural history of the Argonaut, and bearing especially on the long-debated question of the right of the Cephalopod inhabiting the Argonaut shell to be considered as the true fabricator of that shell.

This collection was formed by Madame Power in Sicily in the year 1838, during which period she was engaged in repeating her experiments and observations on the Argonaut, having then full cognizance of the nature of the little parasite (*Hectocotylus*, Cuv.), which had misled her in regard to the development of the Argonaut in a previous suite of experiments described by her in the Transactions of the Giænian Academy for 1836.

As this mistake had been somewhat illogically dwelt on, to depreciate the value of other observations detailed in Madame Power's Memoir, Mr. Owen observed, that it was highly satisfactory to find that the most important of the statements in that memoir had been subsequently repeated and confirmed by an able French malacologist, M. Sander Rang.

The collection of Argonauts,—Cephalopods and shells,—preserved in spirits, included twenty specimens, at different periods of growth, the smallest having a shell weighing not more than one grain and a half, the remainder increasing, by small gradations, to the common-sized mature individual.

The inductions, which the present collection of Argonauts of different ages and sizes legitimately sustained, were in exact accordance with Madame Power's belief that the Cephalopod was the true constructor of the shell, while no contradictory inference had been, or could be, deduced from an examination of the specimens themselves.

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With reference to the second suite of specimens, viz. the ova of the Argonaut in different stages of development, Mr. Owen entered into a detailed account of the new and interesting facts which they revealed. In the ova most advanced, the distinction of head and body was established; the pigment of the eyes, the ink in the ink-bladder, the pigmental spots on the skin, were distinctly developed; the siphon, the beak,—which was colourless and almost transparent,—and the arms were also discernible by a low microscopic power; the arms were short and simple; the secreting membranes of the shell were not developed, and of the shell itself there was no trace.

Mr. Owen then recapitulated as follows, the evidence, which, independently of any preconceived theory or statement, could be deduced from the admirable collection of *Argonauta Argo* due to the labours of the accomplished lady who had contributed so materially to the elucidation of a problem which had divided the zoological world from the time of Aristotle.

1st. The Cephalopod of the Argonaut constantly maintains the same relative position in its shell.

2nd. The young Cephalopod manifests the same concordance between the form of its body and that of the shell, and the same perfect adaptation of the one to the other, as do the young of other testaceous Mollusks.

3rd. The young Cephalopod entirely fills the cavity of its shell: the fundus of the sac begins to be withdrawn from the apex of the shell only when the ovarium begins to enlarge under the sexual stimulus.

4th. The shell of the Argonaut corresponds in size with that of its inhabitant, whatever be the differences in the latter in that respect. ("The observations of Poli, of Prevost, and myself, on a series of *Argonauta rufa*, before cited, are to the same effect.")

5th. The shell of the Argonaut possesses all the requisite flexibility and elasticity which the mechanism of respiration and locomotion in the inhabitant requires: it is also permeable to light.

6th. The Cephalopod inhabiting the Argonaut repairs the fractures of its shell with a material having the same chemical composition as the original shell, and differing in mechanical properties only in being a little more opaque.

7th. The repairing material is laid on from without the shell, as it should be according to the theory of the function of the membranous arms as calcifying organs.

8th. When the embryo of the Argonaut has reached an advanced stage of development *in ovo*, neither the membranous arms nor shell are developed.

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9th. The shell of the Argonaut does not present any distinctly defined nucleus.

Mr. Owen finally proceeded to consider the validity of the best and latest arguments advanced in favour of the parasitism of the Cephalopod of the Argonaut.

Finally, Mr. Owen proceeded to state in detail the points which still remained to be elucidated in the natural history of this most interesting Mollusk. Among other experiments he suggested that the young Argonaut should be deprived of one of the velated arms, and preserved in a marine vivarium, with the view to determine the influence which such mutilation might have on the future growth of the shell: but in proposing further experiments, and while admitting that the period of the first formation of the shell yet remained to be determined, Mr. Owen stated that he regarded the facts already ascertained to be decisive in proof that the Cephalopod of the Argonaut was the true fabricator of its shell.

March 12. The notice of M. Temminck's letter, and the second part of Dr. Cantor's paper, read this day, have been inserted above, pp. 273. 341.

April 9, 1839.—The Rev. F. W. Hope, in the Chair.

A collection of beautifully finished drawings of Tasmanian Fishes was exhibited to the Members present, these drawings having been sent to the Society by Dr. Lhotsky for that purpose. In a letter accompanying these drawings, Dr. Lhotsky stated that they had all been executed, under his own superintendence, from fresh specimens.

A new species of Hamster was exhibited by Mr. Waterhouse, and characterized as follows:

*CRICETUS AURATUS. Cri. aureo-fuscescens, subtùs albidus: pilis mollissimis, suprà ad basin plumbeis, subtùs ad basin cinereis: auribus mediocribus, rotundis: caudà brevissimà pilis albis obsità.*

	unc.	lin.
Longitudo ab apice rostri ad caudæ basin ..	7	6
———— caudæ .....	0	5
———— ab apice rostri ad basin auris ....	1	6
———— tarsi digitorumque.....	0	10
———— auris .....	0	7

*Hab.* Aleppo.

“ This species is less than the common Hamster (*Cricetus vulgaris*), and is remarkable for its deep golden yellow colouring. The fur is moderately long and very soft, and has a silk-like gloss: the deep golden yellow colouring extends over the upper parts and sides of the head and body, and also over the outer side of the limbs: on the back, the hairs are brownish at the tip, hence in this part the fur assumes a deeper hue than on the sides of the body: the sides

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	unc.	lin.
Longitudo ab apice rostri ad caudæ basin ..	7	6
———— caudæ .....	0	5
———— ab apice rostri ad basin auris ....	1	6
———— tarsi digitorumque.....	0	10
———— auris .....	0	7

*Hab.* Aleppo.

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“ The skull, when compared with that of *Cricetus vulgaris*, differs in not having the anterior root of the zygomatic arch produced anteriorly in the form of a thin plate, which in that animal, as in the Rats, serves to protect an opening which is connected with the nasal cavity: the facial portion of the skull is proportionately longer and narrower: in size there is much difference, the skull of *Cricetus auratus* being one inch and six lines in length, and ten lines in breadth, measuring from the outer side of the zygomatic arches.”

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A letter was read from Dr. Weissenborn, dated Weimar, February 19, 1839. It accompanied a female specimen of the Hamster (*Cricetus vulgaris*), which he begged to present to the Society, and related to some longitudinal, naked (or nearly naked) marks which are observable on the hips of that animal.

These marks, Dr. Weissenborn states, are found in every Hamster, though usually hidden by the long fur which surrounds them, and the common opinion of the furriers (who have to cut them out and to repiece the skin) is, that they arise from friction. Being situated over the hip-bones, and therefore more exposed than other parts, the hair is worn whilst the animal is moving in its burrow. This is the opinion also of the earlier authors, but “ is, however, erroneous, as remarked already by Dr. Sulzer, in his valuable monograph on this species, published at Gotha in 1774. These spots are visible the very moment the hair begins to grow, in the naked young, and they are the very places where the growth of the hair becomes first apparent. At this early stage of the animal’s life, they appear on the inner side of the skin, when viewed by transmitted or reflected light, as two dark spots. When all the hair is developed the case is reversed, and these spots appear paler than the rest of the skin. Dr. Sulzer confesses himself to be quite ignorant of the part which these peculiar spots act in the œconomy of the animal, and no subsequent author has explained the subject. I imagine no person, after Sulzer, has turned his attention seriously to it, but it is to be wondered that he was not more successful, being

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“ In the present state of the science of physiology, it may be impossible to state with sufficient precision the conditions on which the peculiar structure of the skin and hair, in these particular spots, depends. The relation in which the latter stand to the hip-bones by peculiar tissues may perhaps help to explain the circumstance, as the neighbourhood of, and connexion with, bony structures, have an evident influence on the nature of the skin and its productions.”

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Long. tot. 8 unc. ; rostri,  $\frac{3}{4}$  ; alæ, 5 ; caudæ,  $3\frac{1}{4}$  ; tarsi, 10 lin.

*Hab.* apud Sinam.

The Chinese Lark very much resembles, and is nearly allied to, the *Alanda Calandra* of authors, but differs in the following particulars. The beak is more compressed, and the upper mandible has two longitudinal grooves on each side, the upper one of which gives a keel-like edge to the culmen; the tail is proportionately longer, the tarsi are shorter; the feet are smaller, and the hinder claws, in-

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stead of being bent downwards, are slightly recurved\*. In the colouring there are also points of distinction: in lieu of the dull brown tint on the top of the head and back, the present species possesses rich rufous brown feathers. In one specimen the body is yellowish white beneath, but in the other it is pure white.

Mr. Waterhouse then proceeded to make some observations upon a series of skulls of Rodents which were upon the table. These skulls belonged chiefly to species of the various genera contained in the families *Chinchillidæ* (consisting of the genera *Chinchilla*, *Lagotis*, and *Lagostomus*), and *Caviidæ*—composed of the genera *Cavia*, *Keironodon*, *Dolichotis*, and *Hydrochærus*. Numerous points of resemblance between these two families were dwelt upon, more particularly in the structure of the teeth, the form of the palate, the contracted glenoid cavity, the form of the lower jaw, and direction of the lower pair of incisors. The *Caviidæ*, however, possess certain characters, independent of those observable in the form of the teeth, which renders it easy to distinguish them from the *Chinchillidæ*. He alluded especially to the shortness of the condyloid process of the lower jaw, the forward position of the coronoid process, the peculiar projecting ridge on the outer side of the horizontal ramus, and the form of the descending ramus or angle of the jaw; this projects considerably beyond the line of the coronoid process, whereas in the *Chinchillidæ* it terminates in a line with the posterior portion of the coronoid process, or projects but slightly beyond that line.

Among the *Chinchillidæ*, the *Lagostomus trichodactylus*, observes Mr. Waterhouse, approaches most nearly to the Cavies, the angle of the lower jaw being less acute and the coronoid process more forward than in the other species.

In the imperfect state of the palate, the narrowness of the anterior and posterior sphenoids, the form of the occipital condyles, the form of the articular portion of the lower jaw, and the almost horizontal direction of the incisors of the lower jaw of the Chinchillas and Cavies, Mr. Waterhouse stated he had found characters which induced him to place those animals next before the *Leporidaæ*.

May 14. Mr. Cunningham's account of the Apteryx, and Mr. Hope's Monograph of *Euchlora*, have been inserted above, pp. 312. 342.

May 28.—William Ogilby, Esq. in the Chair.

A paper from the Rev. R. T. Lowe was read, entitled "A Supplement to the Synopsis of the Fishes of Madeira," inserted above, p. 405.

\* "This difference in the form of the claw cannot be depended on, as the birds have been for some time in confinement; they *may* originally have been straight, but I think they never could have been curved downwards."

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Mr. Waterhouse then proceeded to make some observations upon a series of skulls of Rodents which were upon the table. These skulls belonged chiefly to species of the various genera contained in the families *Chinchillidæ* (consisting of the genera *Chinchilla*, *Lagotis*, and *Lagostomus*), and *Caviidæ*—composed of the genera *Cavia*, *Keironodon*, *Dolichotis*, and *Hydrochærus*. Numerous points of resemblance between these two families were dwelt upon, more particularly in the structure of the teeth, the form of the palate, the contracted glenoid cavity, the form of the lower jaw, and direction of the lower pair of incisors. The *Caviidæ*, however, possess certain characters, independent of those observable in the form of the teeth, which renders it easy to distinguish them from the *Chinchillidæ*. He alluded especially to the shortness of the condyloid process of the lower jaw, the forward position of the coronoid process, the peculiar projecting ridge on the outer side of the horizontal ramus, and the form of the descending ramus or angle of the jaw; this projects considerably beyond the line of the coronoid process, whereas in the *Chinchillidæ* it terminates in a line with the posterior portion of the coronoid process, or projects but slightly beyond that line.

Among the *Chinchillidæ*, the *Lagostomus trichodactylus*, observes Mr. Waterhouse, approaches most nearly to the Cavies, the angle of the lower jaw being less acute and the coronoid process more forward than in the other species.

In the imperfect state of the palate, the narrowness of the anterior and posterior sphenoids, the form of the occipital condyles, the form of the articular portion of the lower jaw, and the almost horizontal direction of the incisors of the lower jaw of the Chinchillas and Cavies, Mr. Waterhouse stated he had found characters which induced him to place those animals next before the *Leporidaæ*.

May 14. Mr. Cunningham's account of the Apteryx, and Mr. Hope's Monograph of *Euchlora*, have been inserted above, pp. 312. 342.

May 28.—William Ogilby, Esq. in the Chair.

A paper from the Rev. R. T. Lowe was read, entitled "A Supplement to the Synopsis of the Fishes of Madeira," inserted above, p. 405.

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June 11.—William Yarrell, Esq., Vice-President, in the Chair.

Mr. Bucknell exhibited his *Eccaleobion*, or machine for hatching eggs; and having broken eggs in every stage of incubation, explained the nature and incidents of the process. Mr. Bucknell stated that the period of incubation in the common fowl, which was, on an average, 21 days, sometimes varied from 18 to 24 days, and that he attributed this variation to the mode of keeping, and previous treatment, by which the embryo was injured, either from the heat of the weather, exposure to variety of temperature, jolting in carriage, &c. The young bird was occasionally known to emit a faint chirp even so long as 24 hours before being excluded; and he believed that if this noise was heard on the 18th day the chickens would probably appear on the 19th. From this and other circumstances, such as the common mode of preparing eggs by varnishing, &c., the porosity of the shell, and other similar causes, he concluded that the small globule of air constantly found in eggs, and which he had observed to increase according to the age of the egg, was produced by the air penetrating the substance of the shell and its lining membrane.

The average number of malformations, according to Mr. Bucknell's experience, was not more than five in a thousand; though in Egypt, it was stated, that malformations were extremely common in the artificial process of incubation. He attributed this circumstance to an excess of heat, and generally found it to affect the toes and extremities; sometimes also the muscles of the neck.

A general conversation afterwards took place on this subject, during which much interesting and valuable information was extracted, with regard to the period and circumstances of the incubation.

A letter from H. Cuming, Esq., Corr. Memb., dated Manilla, November 18, 1837, was read. This letter stated that Mr. Cuming had forwarded a collection containing 395 birds and 12 quadrupeds, from the southern part of the Island of Luzon.

Mr. Cuming states that quadrupeds are scarce in the Philippine Islands, and that he has been able to procure all the species known excepting three, two of which are Deer, and the third is a species of Buffalo, of small size, with straight and sharply-pointed horns. This last animal Mr. Ogilby stated was most probably the *Anoa depressicornis*.

Mr. Ogilby exhibited the skull of an Elk from Nova Scotia, brought over by Dr. Cox, and remarkable for its great size as compared with the dimensions of the horns.

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FELIS SERVALINA. *F. supra fulva, maculis nigris, minutis, copio-sissimis; subtus albida; cauda brevissimâ.*

“This species appears to be about the size of the common Serval, but differs from that animal in having a shorter tail, and in the very numerous and minute black spots which are scattered over the shoulders, back, and flanks. It is only on the thighs and arms that the spots become large and distinct; there they are less numerous, and resemble those of *Felis Serval*. The head and fore part of shoulders are entirely free from spots; the median line of the back is of a deeper fawn than the rest of the body, the minute spots having a particular tendency to run into lines; the belly is of a dirty white colour, with large brown blotches, and the tail does not exceed the length of the same organ in the lynxes. This character is alone sufficient to distinguish the present species from all the other African cats with which I am acquainted. The mutilated condition of the skin unfortunately prevents me from describing the characters of the ears, legs, feet, and under parts of the body.”

	Ft.	In.
Length of the skin from the muzzle to the root of the tail . . . . .	2	10
Length of the tail . . . . .	0	8

As regards the species of *Colobus*, Mr. Ogilby observed, that from information communicated by M. Temminck, he was now convinced that it was identical with the *Colobus polycomos* of Pennant.

Mr. P. Buckley Williams exhibited various specimens of White-Bait (*Clupea alba*, Yarrell,) from the Dovey and some other rivers of North Wales, and stated that the common belief, that this was confined to the Thames, was now proved to be erroneous, not only from the facts now stated, but likewise from their abundance in the river Forth of Scotland, as shown by Dr. Parnell.

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1. *SERRANUS RASOR*. *Ser. maxillis valdè squamosis, apicibus radiorum pectoralium fasciculatis, compressis, lanceolatis; pinnis omnibus præter ventrales squamosis; radiis aculeatis pinnæ dorsi subæqualibus; fasciâ oculum cingenti cæruleâ per lineam lateralem productâ.*

*Radii*:—Br. 7—7; P. 13; V. 1, 5; D. 10, 21; A. 3, 9; C. 15½.

The *Serranus Rasor*, or *Tasmanian barber*, is a beautiful fish belonging to that group of *Serrani* which was named *Anthias* by Bloch, none of which had previously been described as inhabitants of the Australian seas. It agrees with the barber-fish of the Caribbean seas in having no elongated dorsal rays, and may be distinguished readily from all the known *Serrani* by the peculiar form of its pectoral rays, whose numerous branchlets are so graduated and closely approximated as to give a flat lanceolate shape to the tip of each ray. The general colour of the fish is reddish brown, with umber-brown spots, a dark patch beneath the end of the pectorals, a bright blue stripe crossing the anterior suborbital, encircling the eye, and running along the lateral line to the caudal fin. There are also thirteen or fourteen narrower blue streaks on the lower part of the flanks and tail. The fins are lake-red, and are all, except the ventrals, more or less scaly.

2. *CENTROPRISTIS SALAR*. *Cent. operculo suboperculoque squamosis; interoperculo seminudo; preoperculo subdenticulato; pinnis dorsi anique in fossis receptis.*

*Radii*:—Br. 7—7; P. 16; D. 9, 16; V. 1, 5; A. 3, 10; C. 17¾.

This species is known locally as the salmon, and differs from *C. truttaceus*, as described in the *Histoire des Poissons*, in the distribution of the scales on the gill-covers, and in some other minute particulars. *Truttaceus* is said to have the interoperculum and suboperculum entirely naked, and only a few scales on the operculum itself (“*quelques écailles sur sa surface*”). In *C. salar* there are five rows of pretty large scales on the operculum, one row on the suboperculum, covering surfaces of both these bones, and a row of smaller scales on the interoperculum, clothing its upper half only.

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This species is known locally as the salmon, and differs from *C. truttaceus*, as described in the *Histoire des Poissons*, in the distribution of the scales on the gill-covers, and in some other minute particulars. *Truttaceus* is said to have the interoperculum and suboperculum entirely naked, and only a few scales on the operculum itself (“*quelques écailles sur sa surface*”). In *C. salar* there are five rows of pretty large scales on the operculum, one row on the suboperculum, covering surfaces of both these bones, and a row of smaller scales on the interoperculum, clothing its upper half only.

from His Excellency Sir John Franklin, K.C.B., Lieutenant Governor, and now deposited in the museum of the Royal Naval Hospital at Haslar. The collection contains about thirty species, and the paper, which embraces only a part, gives detailed descriptions and anatomical notices of these, several of them being also illustrated by very elaborate drawings, executed by Mr. Charles M. Curtis with his wonted fidelity. The following species are included in the present paper, the others being reserved for a future communication.

1. *SERRANUS RASOR*. *Ser. maxillis valdè squamosis, apicibus radiorum pectoralium fasciculatis, compressis, lanceolatis; pinnis omnibus præter ventrales squamosis; radiis aculeatis pinnæ dorsi subæqualibus; fasciâ oculum cingenti cæruleâ per lineam lateralem productâ.*

*Radii*:—Br. 7—7; P. 13; V. 1, 5; D. 10, 21; A. 3, 9; C. 15½.

The *Serranus Rasor*, or *Tasmanian barber*, is a beautiful fish belonging to that group of *Serrani* which was named *Anthias* by Bloch, none of which had previously been described as inhabitants of the Australian seas. It agrees with the barber-fish of the Caribbean seas in having no elongated dorsal rays, and may be distinguished readily from all the known *Serrani* by the peculiar form of its pectoral rays, whose numerous branchlets are so graduated and closely approximated as to give a flat lanceolate shape to the tip of each ray. The general colour of the fish is reddish brown, with umber-brown spots, a dark patch beneath the end of the pectorals, a bright blue stripe crossing the anterior suborbital, encircling the eye, and running along the lateral line to the caudal fin. There are also thirteen or fourteen narrower blue streaks on the lower part of the flanks and tail. The fins are lake-red, and are all, except the ventrals, more or less scaly.

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As these scales are very easily detached, and the gill-plates remain hard and silvery, after they are removed with the epidermis, it must be difficult to distinguish an injured specimen from *truttaceus*; whose description in other respects exactly accords with *salar*, except that the latter has the suborbital very faintly denticulated, and two rays fewer in the soft dorsal.

3. *APLODACTYLUS ARCTIDENS*. *Aplo. dentibus oris tricuspidatis, superioribus in serie octuplici, inferioribus in serie quintuplici dispositis; cæcis pylori quatuor.*

*Radii*:—Br. 6—6; P. 9 et 6; V. 1, 5; D. 16—1, 17; A. 3, 8; C. 16½.

This species differs from *A. punctatus* of the Chilian seas (the only species previously known) in its dentition, but resembles it so much in external form, colours, and markings, as well as in anatomical structure, that it cannot be placed in a separate genus. In the *Histoire des Poissons* the teeth of *dentatus* are described as follows: “*Les dents sont disposées sur trois rangées à la machoire supérieure et sur deux à l’inférieure: elles sont aplaties et ont leur bords arrondis et dentelés en petits festons; elles sont très-semblables à celles des crénidens, on en compte quatorze de chaque côté à la machoire supérieure et treize à l’inférieure. Derrière ces rangées antérieures il y a des petites dents grenues sur une bande étroite à chaque mâchoire.*” In the Van Diemen’s Land fish, the teeth stand in eight or nine crowded ranks in the upper jaw, and in five or six in the lower one, those of the interior rows being very much smaller in all their dimensions, but otherwise shaped exactly like the teeth of the exterior rows, which resemble those of *punctatus*. Their points show three small lobes, the middle lobe being largest and most prominent. The species further differs from *punctatus* in having four cæca, but its food appears to be similar, the intestines having been found filled with large fragments of sea weed, apparently *Ulva umbilicalis*.

4 and 5. Two new species of gurnard were then mentioned as the first of the genus that have been brought from the Australian coasts, though one species (*Trigla kumu*) is known to inhabit the seas of New Zealand. They were stated to agree with that species, with several Indian ones, and with *Trigla pæcilopectera* of the Mediterranean, in their large pectoral fins being ornamented with eye-like marks similar to those on the wings of some lepidopterous insects. One of them, *TRIGLA POLYOMMATA*, has minute cycloid scales on the body, an unarmed lateral line and the dorsal plates confined to the first dorsal, there being no dilatation whatever of the interspinous bones of the second dorsal. All the spines of the head are stiletto-shaped, and one whose base occupies the whole anterior end of the

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This species differs from *A. punctatus* of the Chilian seas (the only species previously known) in its dentition, but resembles it so much in external form, colours, and markings, as well as in anatomical structure, that it cannot be placed in a separate genus. In the *Histoire des Poissons* the teeth of *dentatus* are described as follows: “*Les dents sont disposées sur trois rangées à la machoire supérieure et sur deux à l’inférieure: elles sont aplaties et ont leur bords arrondis et dentelés en petits festons; elles sont très-semblables à celles des crénidens, on en compte quatorze de chaque côté à la machoire supérieure et treize à l’inférieure. Derrière ces rangées antérieures il y a des petites dents grenues sur une bande étroite à chaque mâchoire.*” In the Van Diemen’s Land fish, the teeth stand in eight or nine crowded ranks in the upper jaw, and in five or six in the lower one, those of the interior rows being very much smaller in all their dimensions, but otherwise shaped exactly like the teeth of the exterior rows, which resemble those of *punctatus*. Their points show three small lobes, the middle lobe being largest and most prominent. The species further differs from *punctatus* in having four cæca, but its food appears to be similar, the intestines having been found filled with large fragments of sea weed, apparently *Ulva umbilicalis*.

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infraorbital on each side, projects boldly beyond the snout, and gives the fish a very different aspect from any other known gurnard.

The other may be thus characterized:—

5. *TRIGLA VANESSA*. *Tri. squamis aspersis mediocribus; lined laterali aculeatâ; fossâ dorsali ad finem usque pinnae posterioris armatâ, orbitâ oculi edentatâ, pinnâ pectorali amplâ labeculis aculeis binis ornatâ, maculâ inter aculeum pinnae dorsi quintum et octavum nigrâ.*

*Radii*:—Br. 7—7; P. 12—III.; V. 1, 5; D. 8, 12; A. 12; C. 13 $\frac{2}{3}$ .

*Trigla Vanessa* has a spinous infraorbital tooth, larger than usual in gurnards, though not so remarkable as in the preceding species, and not occupying the whole end of the bone, there being a smaller tooth and some granulations beneath it. The arming of the dorsal furrow extends to both fins, and is formed by saddle-shaped dilations of the interspinous bones, with a triangular spinous tooth on each side of each plate directed backwards. The scales of the body are rather large, and are studded on their uncovered portions with minute spiny points; those forming the lateral line are tubular both transversely and longitudinally, and are armed with several strong spines also tubular. There is a black mark on the anterior dorsal. The sides of the head are finely granulated without radiations, and there are no denticulations on the edge of the orbit either in this or the preceding species.

6. *Apistes marmoratus* (Cuv. et Val. 4, p. 416). The specimens correspond exactly with the description given in the work referred to, except that the first suborbital has only one tooth anteriorly. The spine of that bone reaches in one specimen to the preoperculum, but in another it is one-third shorter, being in the latter case only just equal to the preopercular spine in length.

7. *Sebastes maculatus* (Cuv. et Val.). Two specimens in good order, when examined in reference to the account of the species in the work referred to, offer no discrepancy, except that the postorbital spines are somewhat different from those of *imperialis*, which *maculatus* is said closely to resemble. *S. maculatus* is an inhabitant of the seas of the Cape of Good Hope, and although a range from thence to Van Diemen's Land may appear very great, it is not more extensive than that of the northern *sebastes* which has been taken on the coasts of Greenland, in the gulf of St. Lawrence, on the coast of Norway, and in the British Channel.

8. *Cheilodactylus carponemus* (Cuv. et Val.), known locally as the Perch, and described as having, when fresh, a bright silvery hue with dark spots.

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the author to be one of those species whose natural position is difficult to ascertain, from their partaking of the characters of several different groups. Viewed as the type of a new genus, *Nemadactylus* may be characterized as having none of the bones of the gill-cover armed or sculptured, the operculum itself being destitute of projecting points, but as differing from any described sparoid form in having simple inferior pectoral rays, one of them projecting beyond the rest, as in *Cheilodactylus*, and in the teeth, which are minute and slender, in a single row on the jaws. The palate, vomer, tongue, and pharyngeal parietes are toothless. The fins are scaleless, the dorsal single, the branchial rays only three in number, the scales cycloid, and the pyloric cæca few (three). There is but one specimen of *Nemadactylus concinnus* in the collection, which is three inches and a half long, has a compressed elliptical form, and a sparoid aspect. Its lateral line is marked by a series of bright thin scales, and beneath it, the integuments are merely silvery with wrinkles, as in some scomberoid fishes; but the specimen has been long in spirits with other fish, and it is possible that the scales of the flanks may have been detached. If they actually existed, they must have been proportionably larger than those on the back, judging from the wrinkles of the epidermis. The scales of the back and top of the head are small, thin, and delicate, like those of a mackerel. Vertebrae 34.

It may be thus characterized:—

NEMADACTYLUS, n. g.

Piscis acanthopterygius. *Operculum* læve, inerme. *Pinnæ* esquamosæ, pinnâ dorsalis unicâ: *radii pinnæ* pectoralis inferiores (sex) simplices, quorum unus productus. *Costæ branchiostegæ* paucae (tres). *Intermaxillarum pediculi* breves. *Dentes* gracillimi minuti in ambitu oris tantum positi. Fauces palatum et lingua glabri. *Squamæ* teneræ, læves, infraque lineam lateralem scomberoideæ. *Cæca pylorica* pauca (tria).

*N. concinnus*, species unica adhuc cognita.

*Radii*:—Br. 3—3; P. 9 et 6; V. 1, 5; D. 17, 28; A. 3, 15; C. 15½.

10. LATRIS HECATEIA is the appellation given by the author to the type of another annectant genus, which he considers as taking its position most naturally among the *Mænoideæ*, but as having many characters in common with a percoid group composed of the genera *Therapon*, *Datnia*, *Pelates*, *Helotes*, and *Nandus*. In *Latris* the mouth is moderately protractile, the dentition is similar to that of *Mæna vomerina*, there is a scaly groove for the reception of the deeply notched dorsal as in *Gerres*, which genus it further resembles in its

the author to be one of those species whose natural position is difficult to ascertain, from their partaking of the characters of several different groups. Viewed as the type of a new genus, *Nemadactylus* may be characterized as having none of the bones of the gill-cover armed or sculptured, the operculum itself being destitute of projecting points, but as differing from any described sparoid form in having simple inferior pectoral rays, one of them projecting beyond the rest, as in *Cheilodactylus*, and in the teeth, which are minute and slender, in a single row on the jaws. The palate, vomer, tongue, and pharyngeal parietes are toothless. The fins are scaleless, the dorsal single, the branchial rays only three in number, the scales cycloid, and the pyloric cæca few (three). There is but one specimen of *Nemadactylus concinnus* in the collection, which is three inches and a half long, has a compressed elliptical form, and a sparoid aspect. Its lateral line is marked by a series of bright thin scales, and beneath it, the integuments are merely silvery with wrinkles, as in some scomberoid fishes; but the specimen has been long in spirits with other fish, and it is possible that the scales of the flanks may have been detached. If they actually existed, they must have been proportionably larger than those on the back, judging from the wrinkles of the epidermis. The scales of the back and top of the head are small, thin, and delicate, like those of a mackerel. Vertebrae 34.

It may be thus characterized:—

NEMADACTYLUS, n. g.

Piscis acanthopterygius. Operculum læve, inerme. Pinnae esquamosæ, pinnâ dorsalis unicâ: radii pinnae pectoralis inferiores (sex) simplices, quorum unus productus. Costæ branchiostegæ paucae (tres). Intermaxillarum pediculi breves. Dentés gracillimi minuti in ambitu oris tantum positi. Fauces palatum et lingua glabri. Squamæ teneræ, læves, infraque lineam lateralem scomberoideæ. Cæca pylorica pauca (tria).

*N. concinnus*, species unica adhuc cognita.

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It may be thus characterized:—

NEMADACTYLUS, n. g.

Piscis acanthopterygius. *Operculum* læve, inerme. *Pinnæ* esquamosæ, pinnâ dorsalis unicâ: *radii pinnæ* pectoralis inferiores (sex) simplices, quorum unus productus. *Costæ branchiostegæ* paucae (tres). *Intermaxillarum pediculi* breves. *Dentes* gracillimi minuti in ambitu oris tantum positi. Fauces palatum et lingua glabri. *Squamæ* teneræ, læves, infraque lineam lateralem scomberoideæ. *Cæca pylorica* pauca (tria).

*N. concinnus*, species unica adhuc cognita.

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*N. concinnus*, species unica adhuc cognita.

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opercular bones, the preoperculum being very finely denticulated, and the operculum terminated by a slightly concave line without projecting angles. The ventrals are still further back than in *Cæcio*, and the cæca are few in number. The scales are cycloid, without teeth or cilia, and the genus, unlike any previously described mænoid group, has the lower pectoral rays simple like those of *aplodactylus*. There are no elongated scales at the base of the ventrals. *Latris Hecateia* is marked by three well-defined dark stripes on each side of the back, with a more diffused one inferiorly on the flanks, the four pyloric cæca are short and wide, and the only specimen in the collection is eleven inches long, which is said to be the ordinary size.

The principal characters of this genus are as follows:—

LATRIS, n. g.

Piscis acanthopterygius, mænoides. *Pinnæ* esquamosæ: dorsi pinnâ unicâ, profunde emarginatâ, in fossâ decumbens: ventrales pinnæ sub abdomine medio positæ. Radii pinnæ pectoralis inferiores (novem) simplices. *Preoperculum* denticulatum. *Os* modicè protendens. *Dentes* in oris ambitu tignoque vomeris positi villosi, in ossiculis pharyngeis parvi, subulati, conferti. *Palatum* linguaque læves. *Squamæ* læves.

*L. Hecateia*, species unica detecta.

*Radii*:—Br. 6—6; P. 9 et 9; V. 1, 5; D. 18, 36; A. 3, 27.

11. THYRSITES ALTIVELIS. *Thyr. radiis pinnæ dorsi aculeatis, corpus altitudine æquantibus; dentibus intermaxillæ utriusque quatuordecim, in latere maxillæ inferioris utroque duodecim.*

*Radii*:—Br. 7—7; P. 14; V. 1, 6; D. 20—1, 11 et VII.; A. 1, 10 & VII.; C. 17 $\frac{2}{3}$ .

A single specimen of this fish in the collection, agrees in most particulars with the description of *Thyrsites atten* in the *Histoire des Poissons*, but the spinous rays of the dorsal fin are considerably higher in proportion, and the teeth on the jaws much fewer.

12. BLENNIUS TASMANIUS is an undescribed species strongly resembling some of the European ones.

13. CLINUS DESPICILLATUS differs from *C. perspicillatus* of the *Histoire des Poissons* in possessing a thicker form, a larger head, a proportionably smaller eye, and in wanting the nuchal marks which give the name to that species. The marks on the body are arranged as in *perspicillatus*, but there are three transverse bands on the pectoral and caudal fins, with many other spots not mentioned in the description of the latter. The dorsal rays are 36, 4, and in other particulars the two fish seem to be much alike.

14. LABRUS LATICLAVIUS. *Lab. smaragdinus, fasciis binis late-*

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14. LABRUS LATICLAVIUS. *Lab. smaragdinus, fasciis binis late-*



*ralibus puniceis purpureo marginatis, posticè in unum coalescentibus, inque pinnâ productis; pinnâ dorsi basi viridâ, in medio latè purpureâ: supernè aurantiacâ, purpureo guttatâ, inque margine extremo cæruleâ; pinnâ ani basi aurantiacâ, dein primulaceo-flavâ, utrinque cæruleo cinctâ, exinde purpureâ cæruleo guttatâ, denique in extremo margine cæruleâ.*

*Radii*:—P. 12; V. 1, 5; D. 9, 11; A. 3, 10; C. 14.

This is a very handsome species, having a duck-green colour, with two lake-red stripes, commencing at the gill-opening and uniting opposite the end of the dorsal to form a single broader stripe which is continued into the caudal fin. These stripes are bordered on both sides by dotted lines of plum-blue, and there are also five rows of blue spots on the sides of the belly, and three rows near the base of the anal fin, on a lake-red ground. Several purple lines radiate from all sides of the orbit, and some pass over the preoperculum, interoperculum, and lower jaw. The dorsal is dark-purple, with green at the base of the rays, and an orange band at the tips, spotted and finally edged with blue. The anal has an orange streak along its base, then a broad primrose-yellow band edged above and below by a narrow blue line, next a broad band of purple with many very regular blue spots, and finally a narrow blue edging. The caudal is purple, with many plum-blue spots near its extremity in a vertical band. The other fins are apparently colourless. The aspect of the fish is that of a *Julis*, but the operculum and cheeks are scaly.

15. *LEPIDOLEPRUS AUSTRALIS*. *Lep. squamis corporis ordinibus plurimis aculeorum arcè incumbentium instructis; pinnâ ani plus duplici altitudine pinnam dorsi posteriorem superante.*

*Radii*:—Br. 6—6; P. 16; V. 1, 6; D. 2, 11—89; C. 1.

This is an example of a genus which had not previously been detected in the southern hemisphere. It has the general form of *Lepidoleprus cælorhynchus*, but there are abundant specific differences, especially in the relative size of the fins, and in the arming of the scales, which in the Antarctic fish consists of rows of closely-incumbent strong spines. The author has compared it with examples of *cælorhynchus* from the Mediterranean, and also from Madeira, both in the Society's museum, whose scales are totally different. None of these examples have the first dorsal ray serrated, as it is stated to be by writers who have described and figured the Greenland and Iceland *Macrourus rupestris*, yet Cuvier states that he has ascertained the identity of the latter with the Mediterranean fish. The first dorsal ray of *L. australis* is also smooth. There are sixty-seven vertebræ, of which fourteen are abdominal. The collection contained three specimens.

A *Platycephalus* intermediate between *fuscus* and *grandispinis*, a

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*ralibus puniceis purpureo marginatis, posticè in unum coalescentibus, inque pinnâ productis; pinnâ dorsi basi viridâ, in medio latè purpureâ: supernè aurantiacâ, purpureo guttatâ, inque margine extremo cæruleâ; pinnâ ani basi aurantiacâ, dein primulaceo-flavâ, utrinque cæruleo cinctâ, exinde purpureâ cæruleo guttatâ, denique in extremo margine cæruleâ.*

*Radii*:—P. 12; V. 1, 5; D. 9, 11; A. 3, 10; C. 14.

This is a very handsome species, having a duck-green colour, with two lake-red stripes, commencing at the gill-opening and uniting opposite the end of the dorsal to form a single broader stripe which is continued into the caudal fin. These stripes are bordered on both sides by dotted lines of plum-blue, and there are also five rows of blue spots on the sides of the belly, and three rows near the base of the anal fin, on a lake-red ground. Several purple lines radiate from all sides of the orbit, and some pass over the preoperculum, interoperculum, and lower jaw. The dorsal is dark-purple, with green at the base of the rays, and an orange band at the tips, spotted and finally edged with blue. The anal has an orange streak along its base, then a broad primrose-yellow band edged above and below by a narrow blue line, next a broad band of purple with many very regular blue spots, and finally a narrow blue edging. The caudal is purple, with many plum-blue spots near its extremity in a vertical band. The other fins are apparently colourless. The aspect of the fish is that of a *Julis*, but the operculum and cheeks are scaly.

15. *LEPIDOLEPRUS AUSTRALIS*. *Lep. squamis corporis ordinibus plurimis aculeorum arcè incumbentium instructis; pinnâ ani plus duplici altitudine pinnam dorsi posteriorem superante.*

*Radii*:—Br. 6—6; P. 16; V. 1, 6; D. 2, 11—89; C. 1.

This is an example of a genus which had not previously been detected in the southern hemisphere. It has the general form of *Lepidoleprus cælorhynchus*, but there are abundant specific differences, especially in the relative size of the fins, and in the arming of the scales, which in the Antarctic fish consists of rows of closely-incumbent strong spines. The author has compared it with examples of *cælorhynchus* from the Mediterranean, and also from Madeira, both in the Society's museum, whose scales are totally different. None of these examples have the first dorsal ray serrated, as it is stated to be by writers who have described and figured the Greenland and Iceland *Macrourus rupestris*, yet Cuvier states that he has ascertained the identity of the latter with the Mediterranean fish. The first dorsal ray of *L. australis* is also smooth. There are sixty-seven vertebræ, of which fourteen are abdominal. The collection contained three specimens.

A *Platycephalus* intermediate between *fuscus* and *grandispinis*, a

*Scorpena*, a *Cheironectes* which is figured in Ross's Annual for 1835, a *Dajaus* closely resembling its American prototypes, several handsome *Balistes* and *Monacanthi*, a *Diodon* and several *Tetrodotes*, a new form of *Torpedo*, some fresh-water fishes, and several other sea ones, are reserved for a future communication.

## GEOLOGICAL SOCIETY.

Nov. 6, 1839.—A paper was read, "On the relative ages of the tertiary and post-tertiary deposits of the Basin of the Clyde," by James Smith, Esq., of Jordan Hill, F.G.S.

In former memoirs, Mr. Smith described the indications which he had observed of changes in the relative level of sea and land in the basin of the Clyde, by which deposits had been laid dry during an extremely recent geological epoch\*; and the evidences adduced by the arctic character of several of the shells, that the climate of Scotland was colder while these beds were accumulating than it is at present†. In this paper he confines his remarks to the results of subsequent observations, which prove, that in these comparative modern deposits there are two distinct formations, differing in climate and the character of their fauna, and separated by a wide interval of time. In the lower or older of these formations, Mr. Smith has found from 10 to 15 per cent. of extinct or unknown species, and he accordingly places it in Mr. Lyell's proposed pleistocene system; whilst in the upper or newer he has found only one species which exists in the present seas, and he accordingly ranges it among the post-tertiary formations of that author. Both these deposits, however, are anterior to the recent or human period.

In the lower or pleistocene formation, Mr. Smith includes the "till" or unstratified accumulation of clay and boulders, and the overlying beds of sand, gravel, and clay containing a mixture of unknown species of shells. He is of opinion that the beds presenting the same order of superposition in the basins of the Forth and the Tay, including the submarine forest of the latter, will be found to be of the same age, though nothing at present is known of their fossils, except the discovery in the elevated beds of the Tay of the *Nucula corbuloides* by Mr. Lyell; and that the parallel roads of Glenroy, recently shown by Mr. Darwin to be of marine origin, may be of cotemporaneous formation. Mr. Smith is also convinced, that a very great proportion of the superficial beds of sand, gravel, and clay are tertiary, although the evidence must sometimes be uncertain, owing to the want of organic remains.

\* Proceedings, vol. ii. p. 427.

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